

MONTANA FISH, WILDLIFE AND PARKS FISHERIES DIVISION

DRAFT Environmental Assessment of Removal of Non-Native Fishes and Expansion of Native Westslope Cutthroat Trout Downstream into Dry Fork Belt Creek

PART I: PROPOSED ACTION DESCRIPTION

A. Type of Proposed Action: Removal of non-native fishes with rotenone and expansion of existing populations of westslope cutthroat trout (*Oncorhynchus clarkii lewisi*) downstream into Dry Fork Belt Creek.

- *To mitigate for the short term loss of fishing opportunity in mainstem Dry Fork, MFWP plans to stock sterile hatchery WCT near popular fishing areas in Dry Fork Creek if the Preferred Alternative of non-native fish removals is selected.*
- *Also, the upper reaches of Dry Fork Belt Creek support both brook trout and WCT. An effort will be made to rescue WCT should the preferred alternative be selected. Native WCT would be collected by electrofishing and moved upstream of the treatment area.*

This EA is focused entirely on potential non-native fish removal efforts in the Dry Fork Belt Creek Drainage. A concurrent/separate action to construct a fish barrier on Dry Fork Belt Creek is underway. This action is being reviewed under CERCLA as a part of Superfund activities occurring in the basin. Should the preferred alternative of non-native fish removals not be selected, construction of a fish barrier will provide a much reduced but important benefit to native westslope cutthroat trout populations.

In a collaborative effort to restore the native fisheries in Dry Fork Belt Creek, a fish barrier is proposed for construction under separate environmental analysis. The fish barrier would be constructed approximately 1.8 miles from the confluence of Dry fork Belt Creek and Belt Creek.

Construction of the fish barrier should provide some benefit to upstream native westslope cutthroat trout populations even if the preferred alternative of fish removal with rotenone is not implemented. Construction of a fish barrier will be completed according to rules and statutory regulations outlined under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). CERCLA applies because the project area is within a Federal Superfund site. The Forest Service will be making a decision to approve the installation of a fish barrier on federal lands on the Dry Fork of Belt Creek. The decision is expected in Spring of 2014 and the construction of the fish barrier is expected in the summer of 2014. For more information regarding this action contact Beth Ihle, On-Scene Coordinator for the Forest Service at 495-3863.

B. Agency Authority for the Proposed Action:

Montana Fish, Wildlife & Parks (MFWP) powers and duties: The department shall implement programs that:

(i) manage wildlife, fish, game, and nongame animals in a manner that prevents the need for listing under 87-5-107 or under the federal Endangered Species Act, 16 U.S.C. 1531, et seq.;

(ii) manage listed species, sensitive species, or a species that is a potential candidate for listing under 87-5-107 or under the federal Endangered Species Act, 16 U.S.C. 1531, et seq., in a manner that assists in the maintenance or recovery of those species. Section 87-1-201(9)(a) M.C.A.

Montana Fish, Wildlife & Parks Fisheries Bureau manages and perpetuates Montana's fish and other aquatic resources and, specifically, maintains optimum fish populations in Montana waters, and provides the diverse, quality angling opportunities that Montanans and visiting anglers demand. The bureau operates nine fish hatcheries, which are not decentralized and report directly to the bureau. Section 87-1-702, M.C.A.

Montana Fish, Wildlife & Parks is a signatory to the Memorandum of Understanding and Conservation Agreement (MOU) for Westslope Cutthroat Trout and Yellowstone Cutthroat Trout in Montana (MFWP 2007) which states: "The management goals for cutthroat trout in Montana are to: 1) ensure the long-term, self-sustaining persistence of each of the subspecies distributed across their historical ranges, 2) maintain the genetic integrity and diversity of non-introgressed populations, as well as the diversity of life histories represented by remaining cutthroat trout populations, and 3) protect the ecological, recreational, and economic values associated with each subspecies."

Additional signatories to the MOU include, American Wildlands, Blackfeet Tribal Business Council, Confederated Salish and Kootenai Tribe, Federation of Fly-Fishers, Greater Yellowstone Coalition, Montana Chapter American Fisheries Society, Cutthroat Trout Conservation, Montana Cutthroat Trout Technical Committee, Montana Department of Environmental Quality, Montana, Department of Natural Resources and Conservation, Montana Farm Bureau Federation, Montana Fish, Wildlife & Parks, Montana Stockgrowers Association, Montana Trout Unlimited, Montana Wildlife Federation, USDA Natural Resource Conservation Service, USDI Bureau of Land Management, USDI Fish and Wildlife Service, USDA Forest Service, Yellowstone National Park

The Cascade Conservation District is an interested and vested partner in this project because it helps to fulfill the intent of the establishment of the Conservation District at MCA § 75-7-102. Intent – policy as follows:

(1) The legislature, mindful of its constitutional obligations under Article II, section 3, and Article IX of the Montana constitution, has enacted The Natural Streambed and Land Preservation Act of 1975. It is the legislature's intent that the requirements of this part provide adequate remedies for the protection of the environmental life support system from degradation and provide adequate remedies to prevent unreasonable depletion and degradation of natural resources. (2) It is the policy of the state of Montana that its natural rivers and streams and the

lands and property immediately adjacent to them within the state are to be protected and preserved to be available in their natural or existing state and to prohibit unauthorized projects and, in so doing, to keep soil erosion and sedimentation to a minimum, except as may be necessary and appropriate after due consideration of all factors involved. Further, it is the policy of this state to recognize the needs of irrigation and agricultural use of the rivers and streams of the state of Montana and to protect the use of water for any useful or beneficial purpose as guaranteed by The Constitution of the State of Montana.

C. Estimated Commencement Date: August 2015 or 2016

D. Location of the Project:

The project site is located in Cascade and Judith counties. The downstream end of the project area is approximately 1.2 miles from the town site of Monarch, MT. Landownership in the project area is US Forest Service and private.

Access to the streambed near private property is currently being pursued and the rotenone project would not commence until landowner consent has been obtained. The fish barrier is being constructed under separate environmental review. The proposed use of piscicides would greatly enhance the benefit of the fish barrier.

The downstream end of the proposed rotenone treatment is located at:

Latitude/Longitude 47.0944°N, 110.8016°W (47°, 5', 39.9" N; 110°, 48', 5.6" W)
The legal description is: Montana, Principal Meridian T15N, R7E, Section 2

The upstream extent of the proposed treatment is located at:

Latitude/Longitude 46.9896°N, 110.6442°W (46°, 59', 22.5" N; 110°, 38', 39.1" W)
The legal description is: Montana, Principal Meridian T14N, R9E, Section 7

E. Project Size (acres affected)

1. Developed/residential – 0 acres
2. Industrial – 0 acres
3. Open space/Woodlands/Recreation – 0 acres
4. **Wetlands/Riparian – The rotenone treated length of Dry Fork Belt Creek and associated tributaries would be approximately 20 miles (Figure 1).**
5. Floodplain – 0 acres
6. Irrigated Cropland – 0 acres
7. Dry Cropland – 0 acres
8. Forestry – 0 acres
9. Rangeland – 0 acres

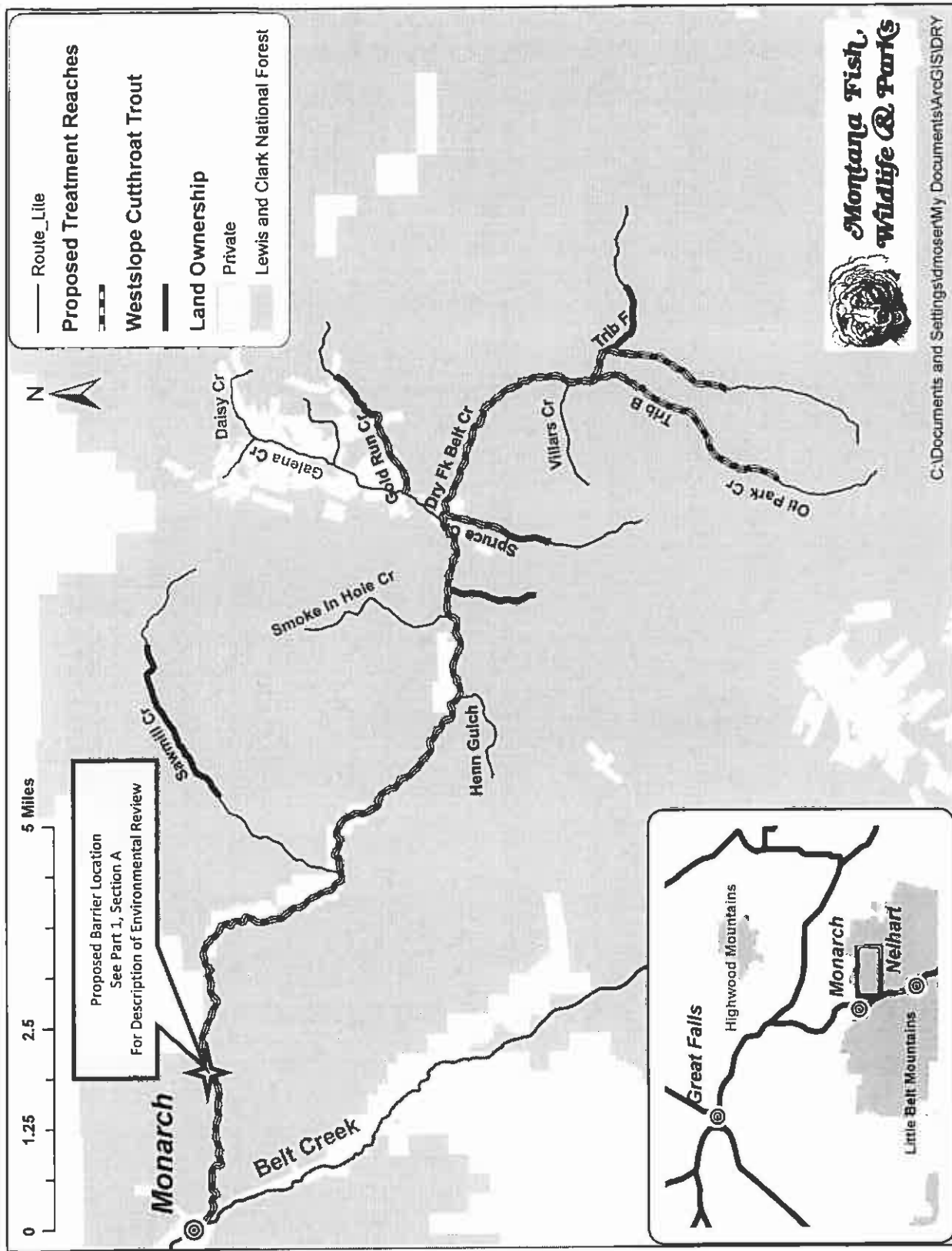


Figure 1. Map of the project area, dashed line represents proposed rotenone treatment area.

F. Narrative Summary and Purpose of the Proposed Action

The proposed action would include:

- Removal of non-native fishes from mainstem Dry Fork and several tributaries with piscicides (rotenone) upstream of a cast in place concrete fish barrier (see part I Section A for a description of fish barrier.).
- Natural expansion of existing populations of WCT into downstream reaches where non-native fishes would be removed.
- Limited transfer of juvenile and adult WCT or fertilized eggs into downstream reaches of Dry Fork Creek

Proposed mitigation for the temporary reduction in a recreational fishery after piscicide removals and the change from a primarily brook trout fishery to native WCT fishery:

- Temporary stocking of sterile WCT obtained from Washoe Park Hatchery (Anaconda Montana). This stocking would provide a recreational fishery during the period just after treatment to full colonization by upstream sources of westslope cutthroat trout.
- Future change in regulations to allow a harvest of WCT in the Dry Fork of Belt Creek – currently there is a 20 fish limit for brook trout in the project area.
- Electrofishing rescue of WCT in upper reaches of Dry Fork Belt Creek that currently support both brook trout and WCT.

History of the Problem and Impetus for the Proposed Action

The Dry Fork of Belt Creek (Dry Fork Creek) has a long history of mining. The Block P and other mines produced lead silver ores from prior to the 1800's until the 1940's resulting in accumulated mine waste adjacent to the Dry Fork of Belt Creek and Galena Creek. The Environmental Protection Agency (EPA) listed the Dry Fork Belt Creek area as a federal Superfund site in 2000 due to the threat of metals contamination to humans and the environment. The mining effects rendered segments of Dry Fork Creek uninhabitable for fish and most other aquatic species. The EPA and the Forest Service have negotiated and reached agreement with responsible parties (PRPs) to conduct cleanups in this drainage which has resulted in two major removal efforts, one still ongoing. Mine reclamation at the Block P mine complex was initiated in 2011 and will continue into 2012-13. The Block P and its adjacent mines are primary contributors to water quality degradation in the Dry Fork of Belt Creek (Techlaw, Inc., February, 2011; Barr Engineering, Inc., 2011). The scope of the PRP negotiated cleanups have been limited to direct waste removal and placement in a repository. EPA also recovered limited cleanup costs from the Asarco LLC bankruptcy and some of these funds are being used as cash match in this project. Recently, efforts have begun to reclaim mine waste in the headwaters of Dry Fork Creek. Previously fishless areas of upper Dry Fork Creek, specifically Galena Creek may at some time be able to support fish populations. The improvement of water quality

conditions for fish will have the unwanted effect of putting existing remnant populations of westslope cutthroat trout (WCT) at increased risk of invasion by non-native fish species. Non-natives residing downstream could potentially invade the barren reaches of Dry Fork of Belt Creek. This access may threaten partially protected populations of WCT as water quality conditions improve following mine reclamation.

In the absence of barriers to upstream movement of non-native fishes, WCT are vulnerable to hybridization with rainbow trout (Hitt et al. 2003; Leary et al. 1995) and displacement by brook trout (Fausch et al. 2009). Mainstem Dry Fork Creek is currently dominated by the aforementioned non-native fishes. Non-hybridized WCT currently occupy less than 4% of historically occupied habitat in northcentral Montana (Moser, 2011). Hybridized populations of WCT (< 1% hybridization) occupy approximately 6 miles of a total of 26 miles of historically occupied habitat in the Dry Fork drainage (MFWP 2012). All of the existing non-hybridized populations are relegated to small sections of headwater streams and are in some cases protected or partially protected from non-native fishes by waterfalls or man-made barriers. MFWP stocking records indicate that 18,160 rainbow trout were stocked in Dry Fork Creek from 1945 to 1950, 3,000 brook trout were stocked from 1940 to 1947, and 55,000 Yellowstone cutthroat were stocked from 1928 to 1950.

Need, Immediacy, Severity

This project mitigates for potential losses of WCT due to mining related damages and subsequent cleanup activities in the Dry Fork of Belt Creek drainage in the Barker-Hughesville mining district. The Barker-Hughesville Superfund site was listed on the National Priorities List of the nation's most contaminated sites in 2001. The listing of this site was a result of water quality and sediment sampling that indicated heavy metals including lead, zinc and arsenic and other metals were directly impacting the surface waters of the Dry Fork of Belt Creek watershed. Over 45 sites and surface and groundwater locations have been inventoried in this basin as contributors to this problem. Native fisheries were decimated by the mining related impacts in the watershed and over time non-native fish species have become the dominant fishery. While progress in water quality improvement is necessary, it cannot occur at the expense of a sensitive species of fish or the overall goal of mine waste cleanup would be diminished. Thus, the parallel effort to protect and enhance native WCT is necessary and time critical and EPA has provided resources in support of this effort. Ultimately, one of the overall goals of water quality improvement in this drainage after human health is aquatic habitat improvement.

Westslope cutthroat trout were first described by Lewis and Clark in 1805 near Great Falls, Montana. WCT are recognized as one of 14 interior subspecies of cutthroat trout and are found in Alberta, Idaho, Washington, and Montana. In Montana, WCT occupy the Upper Missouri River drainages east of the Continental Divide and the Upper Columbia Basin west of the Continental Divide (Behnke 1992). Although still widespread, WCT distribution and numbers have declined significantly in the past 100 years due to a variety of causes, including loss of habitat, competition and predation from non-native fish species, and hybridization (Shepard et al. 2003, Shepard et al. 1997, McIntyre and Rieman 1995, Liknes 1984, Hanzel 1959). Genetically unaltered WCT currently occupy approximately 8% of their historic habitat across their entire range (Shepard et al. 2003).

The marked decrease in WCT density and distribution led to them being listed in 1972 as a State Species of Special Concern by the MFWP. WCT were petitioned for listing as threatened under the federal Endangered Species Act in June 1997. The state of Montana developed a statewide WCT Conservation Agreement in 1999 (MFWP 1999) with the help of a technical committee formed in 1994 and a steering committee formed in 1996. The Conservation Agreement was signed by several state and federal agencies as well as several non-government organizations. In 2000, a northcentral Montana WCT restoration plan was developed to implement the goals and objectives of the WCT Conservation Agreement (Tews et al. 2000). In 2007, an updated restoration plan (Moser et al. 2009) was drafted to monitor WCT restoration progress and refocus goals toward objectives outlined in an updated WCT Conservation Agreement (MFWP 2007).

In April of 2000, following an extensive status review, the U.S. Fish and Wildlife Service (USFWS) determined that westslope cutthroat trout were “not warranted” for federal listing. That finding was challenged in federal court, and the court remanded the not warranted finding back to the USFWS for additional review. In 2003, after additional review, the USFWS determined that WCT are not likely to become a threatened or endangered species in the foreseeable future, therefore listing was not warranted. The second finding of “not warranted” is again being challenged in federal court.

Status of WCT in Belt Creek, Dry Fork Belt Creek and Justification for Proposed Restoration

Dry Fork Creek currently supports five tributary populations of WCT greater than 99% genetic purity. The mainstem Dry Fork Creek supports primarily non-native brook trout. Other species present in lower numbers in Dry Fork Creek include, rainbow trout, hybridized WCT, sculpin, and long nosed dace. The status and conservation needs of WCT in Montana have been well described in numerous documents (Shepard et al. 2003, Shepard et al. 1997, McIntyre and Rieman 1995, Liknes 1984, Hanzel 1959). This project fulfills the goals of Statewide Conservation Agreement strategies by protecting existing WCT populations and enhancing the available stream miles for WCT. By constructing a fish barrier near the mouth of Dry Fork Creek, existing populations of WCT will be protected. In addition, construction of a fish barrier near the mouth of the Dry Fork Creek; combined with removal of existing non-native fishes in the mainstem and a few tributaries, will address the more difficult goal of maintaining connected tributary populations in a large drainage (metapopulations) of WCT that exhibit multiple life histories. One of the life histories we hope to restore is fluvial, i.e. large WCT that live in the mainstem of Dry Fork Creek and travel up tributaries to spawn. Movement between isolated tributary populations will help ensure the genetic integrity of the Dry Fork Creek fishery as a whole. Finally, the large size of the proposed project will ensure that these fish will survive in perpetuity, even if challenged by catastrophic events such as wildfire, drought, and disease.

Given the commitment to WCT restoration in Montana as evidenced by a Conservation Agreement (MFWP 2007) and the willingness to commit financial and human resources to restoring WCT populations targeted by this project, this project should be attainable and effective. The Memorandum of Understanding and Conservation Agreement for WCT and Yellowstone cutthroat (MFWP 2007) outlines the status and processes necessary to restore WCT populations to self-sustaining levels. The Conservation Agreement was signed by, among

others, six non-governmental organizations, five Federal Agencies, one Tribe and the Montana Farm Bureau and Montana Stockgrowers Associations. Technical feasibility and commitment from nongovernmental organizations, federal and state agencies, and the public will ensure that the goals and objectives of this project are met. The Conservation Agreement outlines the measures necessary to restore connectivity and genetic integrity of WCT populations in Montana. This project meets all the objectives and uses the appropriate techniques described in the Conservation Agreement.

Public Benefits Narrative

The preferred alternative directly benefits native fish populations and the public who fish for them. The Dry Fork drainage is a popular dispersed recreation area for nearby residents and recreationists from Great Falls. This project will ensure that westslope cutthroat trout, Montana's State fish and the only trout native to the Dry Fork of Belt Creek drainage is preserved over the short and long term by providing for expansion of its habitat.

Current mine remediation activities at Galena Creek, if successful, will create conditions amenable to the survival and reproduction of extant populations of WCT in that tributary. Much of the current Dry Fork Belt Creek drainage - primarily mainstem and lower reaches of tributaries - is currently occupied by non-native brook trout and rainbow trout. These non-native populations will be the primary source for recolonization of fishless reaches should cleanup efforts come to fruition. The lower reaches of Gold Run Creek support a genetically pure population of WCT. In the event Galena Creek is restored by reclamation, lower Gold Run Creek WCT would be directly threatened by invasion of brook trout and rainbow trout. Upper Dry Fork Belt Creek, including Oti Park Creek are currently slightly hybridized and in competition with brook trout. If Galena Creek and mainstem Dry Fork Belt Creek habitat quality improves significantly, the current rate of invasion and subsequent hybridization and competition may increase in upper portions of the Dry Fork of Belt Creek.

This project will help ensure that native WCT are conserved and protected over the long term in the Dry Fork of Belt Creek. Moreover, this project will allow a full complement of life history expression; something that is not achievable under the current conditions (Fausch et al. 2009; and Drinan et al. 2011). Connectivity throughout Dry Fork Creek will encourage fluvial life histories wherein larger adult WCT living in the mainstem of Dry Fork Creek can access tributaries for spawning. Perpetuating genetic exchange between populations of resident WCT in the various headwater tributaries will also benefit the genetic health of Dry Fork Creek WCT (Allendorf et al. 2004; Drinan et al. 2011; Fausch et al. 2009).

The cutthroat trout is the State Fish of Montana. The WCT is the only trout native to the Missouri River drainage. WCT are part of the history and legacy of Montana. Currently, state fishing regulations are catch and release only for WCT in streams and rivers. If this project were implemented, WCT populations in Dry Fork Creek would likely reach densities high enough to allow limited harvest by the public. This project would directly benefit the public by expanding the native populations of WCT downstream to more highly fished areas; while still allowing a limited harvest for human consumption.

Most reaches of Dry Fork Belt Creek would have very low densities of fish several years post treatment. MFWP plans to mitigate for this lost fishing opportunity through stocking of sterile hatchery WCT (M012 strain, Washoe Park Fish Hatchery). These stocked fish should grow rapidly in Dry Fork Creek and MFWP would consider allowing harvest of these fish.

Projects which restore WCT to historical habitats are crucial to preventing future listing of WCT under the Endangered Species Act. If WCT were to ever be listed as threatened or endangered there is a potential for increased federal regulatory restrictions on land use.

Numerous smaller projects completed in northcentral and southwest Montana have shown that after removal of competing and hybridizing species WCT populations will thrive. Smaller restoration projects (less than 2 miles of restored stream) have some uncertainty associated with long term genetic health and the potential for catastrophic events; i.e. fire, drought, disease negatively impacting restored populations. This projects size eliminates long term genetic concerns. The only other uncertainty is the potential for illegal transfer of non-native fishes upstream of the fish barrier. Since the stream channel is dry upstream and downstream of the fish barrier during late summer and winter some of this threat is decreased.

With the increase in available habitat for WCT in a popular public recreation area, this project will provide a direct benefit to recreationists who enjoy fishing for WCT a native trout species.

Proposed Project

The Dry Fork of Belt Creek currently supports five tributary populations of WCT greater than 99% genetic purity. The mainstem of Dry Fork Creek supports primarily non-native brook trout. Other species present in lower numbers in the Dry Fork include: rainbow trout, hybridized WCT, and long nosed dace. The status and conservation needs of WCT in Montana have been well described in several documents. The most recent comprehensive multi-state Status Assessment (Shepard et al. 2003) described the distribution and abundance of WCT along with threats to persistence range wide. The Conservation Agreement (MFWP, 2007) presented the results of the status assessment and specified specific objectives and goals to protect current populations of WCT and restore WCT where feasible. Both documents describe the need to protect WCT populations with fish barriers where necessary and when possible protect larger metapopulations (i.e. numerous connected tributary populations). The proposed project site fulfills both goals. By constructing a fish barrier near the mouth of Dry Fork Creek, several existing populations of WCT will be protected. In addition, construction a fish barrier near the mouth of the Dry Fork Creek; combined with removal of existing non-native fishes in the mainstem and a few tributaries, will address the more difficult goal of maintaining large metapopulations of WCT that exhibit multiple life histories.

Currently, 20 genetically pure populations of WCT occupy 31 miles of stream in the entire Belt Creek drainage (12% of historically occupied habitat) and 17 populations of slightly hybridized WCT occupy 52 miles of stream (21% of historically occupied habitat); importantly, the majority of slightly hybridized populations are at continued risk of hybridization and competition with non-native species. The estimated total miles of historically occupied habitat (WCT) in the greater Belt Creek watershed was about 240 miles of stream. The proposed barrier site on the Dry Fork of Belt Creek has the potential to provide over 26 miles of habitat for WCT with

predicted improved water quality conditions after cleanup efforts. The northcentral Montana subbasin plan identifies the need to protect current populations of slightly hybridized WCT in the headwaters of the Dry Fork of Belt Creek drainage, including; Sawmill Creek, Spruce Creek, and Bender Creek: the proposed barrier site and fish removal plans would accomplish this goal

Access

Access to the streambed near private property is currently being pursued and the project would not commence until landowner consent has been obtained.

Private landowners would be given the option of becoming signatories to the Candidate Conservation Agreement with Assurances. As signatories to the Agreement, private landowners would be exempt from any federal regulatory restrictions should WCT ever become listed under the Endangered Species Act.

Montana's Efforts to Restore WCT Populations

Construction of non-native fish barriers has been relatively commonplace and used frequently as a tool for restoration of WCT in Montana, and of other native fishes throughout intermountain west. At least 30 barriers have been constructed in northcentral and southwest Montana over the last 15 years. Elements critical to construction of effective barriers have been iteratively refined by a small community of design engineers. The design of fish barriers incorporates fine scale topographic surveys of barrier location, analysis of flow recurrence and flow behavior over the barrier structure using Corp of Engineers design HEC-RAS analysis, and inclusion of a safety factor based on known jumping capabilities of non-native fishes. All barrier projects must go through an intensive process with involvement of fish biologists and engineers to maximize effectiveness under a wide range of flow conditions.

Piscicide removals of fishes has been a tool used extensively in Montana and other states for many years. Piscicide applications are strictly regulated to meet project needs and safety requirements of the EPA, DEQ, and the Montana Dept. of Agriculture. Bioassays are used to determine the minimum amount of piscicide necessary to remove fish given the water chemistry and physical characteristics of the stream. Pre-project surveys of drainages to be treated are used to identify the necessary upstream limits of treatment and flow rate. The technology and expertise to conduct a project of this scale has been proven in other projects throughout the State of Montana. A significantly larger rotenone project in the Cherry Creek drainage (Madison River) of over 60 miles was recently safely and effectively completed. There are no other methods available to remove non-native fishes from large drainages such as the Dry Fork of Belt Creek. In smaller streams (< 2 miles), electrofishing has been used to eliminate brook trout. Even in these small streams; removal efforts are necessarily extremely labor intensive and protracted, with most projects taking 5 to 6 years to complete. Piscicides are relatively inexpensive and direct application of piscicides in a stream of this size would likely require less than ten days of effort.

There is an abundance of evidence both in management and technical publications of the threats to persistence of cutthroat trout from hybridization and competition with non-native fishes. There have been over 20 publications in peer reviewed journals describing the prevalence and

mode of competition between non-native brook trout and cutthroat trout. There have been more than 50 publications in peer reviewed journals describing the problem of hybridization between native cutthroat trout and non-native species in the same genus (e.g. rainbow trout x WCT crosses). Concerted efforts to restore WCT to historical habitats are necessary to prevent a potential future listing under the Endangered Species Act, extinction, and loss of an important historical legacy of the State of Montana. Finally, in light of the problem, comprehensive subbasin plans have been developed to identify and describe local populations of WCT and potential areas for protection, expansion, or restoration (Moser et al. 2011; Nelson et al. 2009).

The total miles of habitat occupied by non-hybridized WCT is essentially unchanged from 2000 to 2011 (MFWP 2012). This is despite the addition of 21 miles of newly occupied habitat through fish transfers and protection of 55 miles of WCT habitat through construction of fish barriers. Maintenance of a status quo of miles of stream and number of populations should be seen as progress. Unfortunately, maintaining the current level of occupied habitat will not ensure long term persistence of the species (>100 years). However, conservation actions completed in northcentral Montana have prevented the percentage of non-hybridized populations from dropping to approximately 1.5% of historically occupied habitat. A new Conservation Agreement (MFWP 2007) includes benchmarks based on genetic risks, demographic risks, and maintenance of the number of miles of conservation populations at least as high as identified in 1999. This project would be a significant step in ensuring persistence of native WCT in Montana over the long term.

Cost/Benefit Analysis

Costs and funding sources for piscicide removals are described on page 36 of this document. Costs in the budget table also include costs and funding sources for the fish barrier. These costs are included to illustrate the collaborative nature of the project as a whole.

Staffing and Administration

Montana Fish Wildlife and Parks

MFWP Project Lead (Dave Moser – full time, project coordinator) – Responsible development of Environmental Assessment, scoping, public meetings. Should the preferred alternative be selected Dave Moser would be responsible for application of piscicides, stocking of sterile WCT, and expansion of native WCT in tributaries downstream to mainstem Dry Fork.

Cooperators

Forest Service representative (Beth Ihle, Geologist, Lewis and Clark National Forest – part time, cooperator) coordination of agency management and decision activities, noxious weed control plan and field support for fish removal and monitoring. Forest Service fish biologist Kendall Cikanek– coordination between MFWP and USFS.

U.S. EPA representative (Roger Hoogerheide, part time cooperator) – provides supporting funds for design, provides water quality sampling data prior to and following project implementation.

Permits/Environmental Analysis and Decision

MFWP would apply rotenone under the Montana Dept. of Environmental Quality (DEQ) General Permit for Pesticide Application (#MTG87000). A Notice of Intent was accepted by the Department of Environmental Quality. The NOI included the waters proposed in this EA. A letter was received from DEQ dated August 13, 2012 recognizing the Notice of Intent and allowing MFWP to operate under the General Permit for Pesticide Application.

PART II: ALTERNATIVES

A. Alternative 1 – No Action

If no action is taken, status quo management of the fisheries in the Dry Fork of Belt Creek would occur and there would be the potential for increases in the range of non-native fishes with concomitant negative impacts to remnant WCT populations. Under this scenario, competition and exclusion would continue to occur – and potentially increase - in the upper Dry Fork Belt Creek tributaries as water quality improves with mine reclamation. Several existing populations of WCT may be eliminated, increasing the overall risk of extinction for the species, a net loss of genetic diversity within the species, and an increase in the potential for future listing under the Endangered Species Act.

B. Alternative 2 - Proposed Action – Removal of non-native fishes with piscicides and expansion of existing native WCT populations downstream.

The predicted benefits of Alternative 2 include:

- Restoration and protection of WCT in approximately 26 miles of historically occupied habitat. WCT restoration projects of this size are necessarily very rare but key to long term restoration and maintenance of WCT in the Missouri River drainage.
- Protection of a WCT population that can express multiple life histories and maintain genetic integrity through habitat connectivity.
- Reduction in the risk of potential listing under the Endangered Species Act.
- This project would also provide a unique opportunity for anglers to fish for and harvest Montana's native trout in accessible areas of Lewis and Clark National Forest.

C. Alternatives Considered but Eliminated from Further Analysis

Alternative 3 – Mechanical removal or change in harvest regulations

This alternative would include mechanical removal of non-native fishes from 20 miles of stream. This alternative would be extremely costly and would likely only provide for short term increases in abundance of westslope cutthroat trout. The most abundant non-native fish in the mainstem of Dry Fork Belt Creek is brook trout (*Salvelinus fontinalis*). Brook trout spawn in the fall and WCT spawn in the spring. Because brook trout spawn in the fall they emerge months

earlier than WCT. This early emergence gives them a competitive and predatory advantage over WCT. In addition, brook trout are sexually mature at ages 1 and 2. WCT are sexually mature at ages 3 and 4. Mechanical removal of brook trout would not eliminate all brook trout in the drainage because of the size and complexity of the stream – eventually brook trout would likely once again displace any short term gains in WCT abundance. Harvest regulations in the Dry Fork are already very lenient – 20 fish daily. Even with the current daily limits, brook trout are very abundant. Because the goal of permanently restoring a connected population of WCT in the Dry Fork drainage would not be attained through this alternative it was eliminated from additional consideration.

PART III. ENVIRONMENTAL REVIEW

A. PHYSICAL ENVIRONMENT

1. <u>LAND RESOURCES</u>	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
Will the proposed action result in:						
a. Soil instability or changes in geologic substructure?		X				
b. Disruption, displacement, erosion, compaction, moisture loss, or over-covering of soil which would reduce productivity or fertility?		X				
c. Destruction, covering or modification of any unique geologic or physical features?		X				
d. Changes in siltation, deposition or erosion patterns that may modify the channel of a river or stream or the bed or shore of a lake?		X				
e. Exposure of people or property to earthquakes, landslides, ground failure, or other natural hazard?	X					

2. <u>WATER</u>	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
Will the proposed action result in:						
a. Discharge into surface water or any alteration of surface water quality including but not limited to temperature, dissolved oxygen or turbidity?			X		Yes	2a
b. Changes in drainage patterns or the rate and amount of surface runoff?		X				
c. Alteration of the course or magnitude of flood water or other flows?		X				
d. Changes in the amount of surface water in any water body or creation of a new water body?		X				
e. Exposure of people or property to water related hazards such as flooding?		X				
f. Changes in the quality of groundwater?		X				2f
g. Changes in the quantity of groundwater?		X				
h. Increase in risk of contamination of surface or groundwater?			X		Yes	See 2f

i. Effects on any existing water right or reservation?		X				
j. Effects on other water users as a result of any alteration in surface or groundwater quality?		X				2j
k. Effects on other users as a result of any alteration in surface or groundwater quantity?		X				See 2c
l. Will the project affect a designated floodplain?		X				
m. Will the project result in any discharge that will affect federal or state water quality regulations? (Also see 2a)			X		Yes	2m

Comment 2a: The proposed project is designed to intentionally introduce a pesticide to surface water to remove unwanted fish. The impacts would be short term and minor. Prentox (7% powder) and CFT Legumine (liquid) rotenone are EPA registered pesticides and are safe to use for removal of unwanted fish. The concentration of CFT Legumine (5% liquid) proposed is 0.5 to 1 part per million, but could be adjusted lower within the label allowed limits based upon the results of on-site assays. Prentox (7% powder) may be used in a sand and gelatin mix to treat springs and seeps within the treatment area. An equivalent EPA approved rotenone product may be used if CFT Legumine is unavailable at the time of treatment.

There are three ways in which rotenone can be detoxified once applied. The most common method is to allow natural breakdown to occur. Rotenone is a compound that is susceptible to natural breakdown (detoxification) through a variety of mechanisms such as water chemistry, water temperature, exposure to organic substances, exposure to air, and sunlight intensity (Ware 2002; ODFW 2002; Loeb and Engstrom-Heg 1970; Engstrom-Heg 1972; Gilderhus et al. 1986). Rotenone persistence studies by Gilderhus et al. (1986) and Dawson et al. (1991) found that in cool water temperatures of 32 to 46°F the half-life ranged from 3.5 to 5.2 days. Gilderhus et al. (1986) reported that 30% mortality was experienced in rainbow trout exposed to degrading concentrations of actual rotenone (0.004 ppm) in 46°F pond water 14 days after a treatment. By day 18 the concentrations were sub-lethal to trout. The second method for detoxification involves basic dilution by fresh water. This may be accomplished by fresh ground water or surface water flowing into a lake or stream. The final method of detoxification involves the application of an oxidizing agent like potassium permanganate at the downstream end of the treatment. This dry crystalline substance is mixed with stream or lake water to produce a concentration of liquid sufficient to detoxify the rotenone. Detoxification is accomplished after about 15-30 minutes of exposure time between the two compounds (Prentiss Inc. 2007). We would expect the treated stream above the barrier to naturally detoxify within 48 hours of the treatment. The treated stream would rapidly detoxify through addition of fresh water from untreated upstream sources and through the aforementioned physical and chemical breakdown processes. Inert ingredients (e.g. carriers) in CFT Legumine volatilize rapidly in the environment by both photolysis and hydrolysis and therefore do not pose a threat to the environment at the levels proposed for fish eradication.

Comment 2f: No contamination of groundwater is anticipated to result from this project. Rotenone binds readily to sediments, and is broken down by soil and in water (Skaar 2001; Engstrom-Heg 1971, 1976; Ware 2002). Rotenone moves only one inch in most soil types; the only exception would be sandy soils where movement is about three inches (Hisata 2002). In California, studies where wells were placed in aquifers adjacent to and downstream of rotenone applications have never detected rotenone, rotenolone, or any of the other organic compounds in the formulated products (CDFG 1994). Case studies in Montana have concluded that rotenone movement through groundwater does not occur. For example, at Tetrault Lake, Montana, neither rotenone nor inert ingredients were detected in a nearby domestic well which was sampled two and four weeks after applying 90 ppb rotenone to the lake. This well was chosen because it was down gradient from the lake and also drew water from the same aquifer that fed and drained the lake. In 1998, a Kalispell-area pond was treated with Prenfish 5% rotenone. Water from a well, located 65 feet from the pond, was analyzed and no sign of rotenone was detected. In 2001, another Kalispell-area pond was treated with Prenfish 5% rotenone. Water from a well located 200 feet from that pond was tested four times over a 21 day period and showed no sign of contamination. In 2005, MFWP treated a small pond near Thompson Falls with Prenfish to remove pumpkinseeds and bass. A well, located 30 yards from the pond, was tested and neither Prenfish nor inert ingredients were detected (Don Skaar, *personal communications*).

Groundwater monitoring in the area indicates that the Dry Fork Belt Creek aquifer runs south to north in the project area. "Most wells in the area are either too shallow or too deep to be effected by water from the losing reach [of Dry Fork Belt Creek]. The closest wells that are potentially completed in or below the Jefferson Dolomite are approximately two miles northwest of the site and are likely not downgradient of the losing reach." (Figure 2 - EPA 2013)

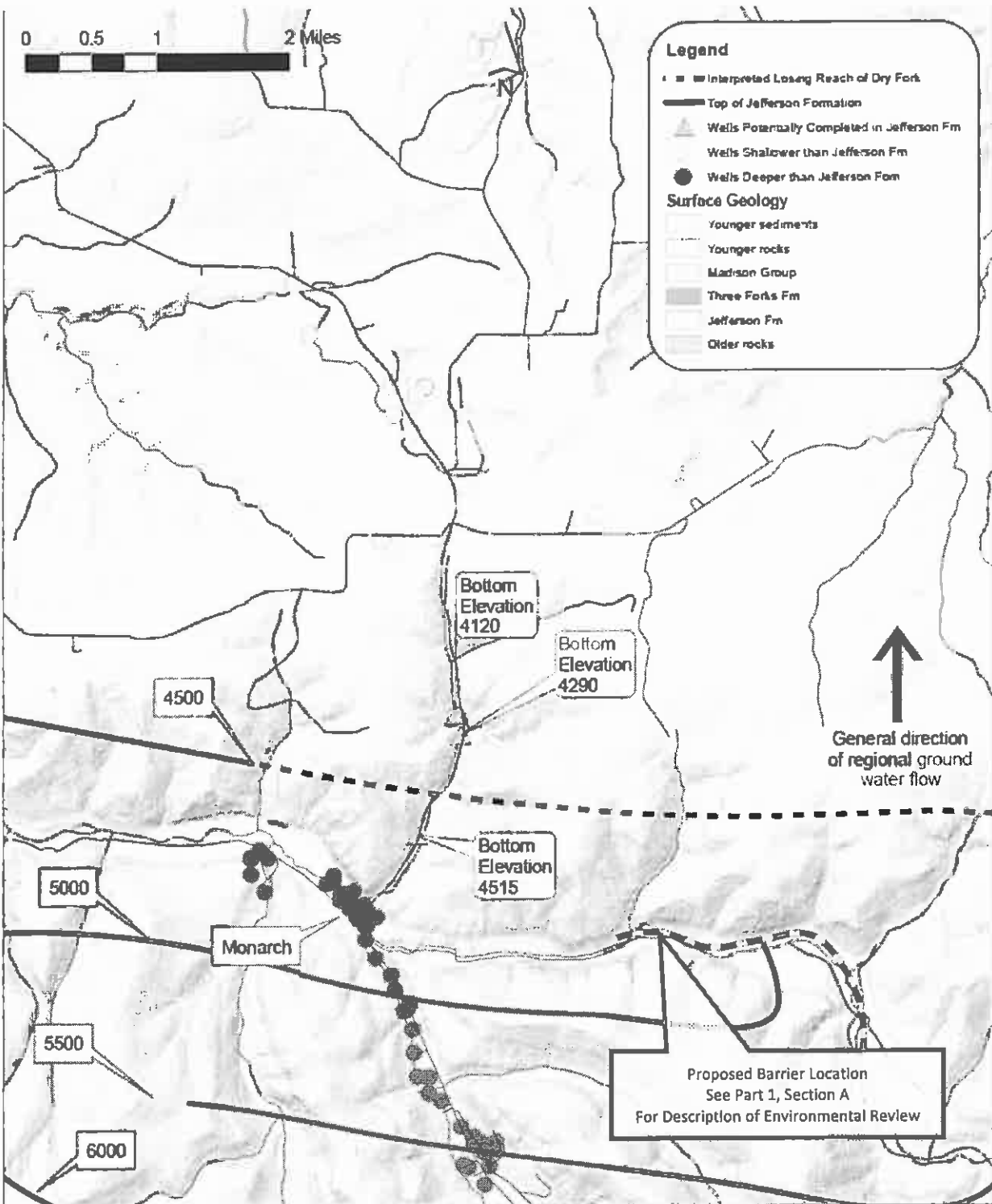


Figure 2
Geologic Setting of Area Wells
 Bedrock Groundwater near the Losing
 Reach of Dry Fork Belt Creek

**CDM
 Smith**

Figure 2. Northward direction of regional groundwater flow

Comment 2j: The CFT Legumine label states “....Do not use water treated with rotenone to irrigate crops or release within 1/2 mile upstream of a potable water or irrigation water intake in a standing body of water such as a lake, pond or reservoir...” There are no irrigation or potable water intakes within ½ mile of the proposed treatment area. Recreationists currently use water from Dry Fork Creek for their pets and horses, and for themselves after filtering. The treatment zone would be thoroughly posted to caution against use of the water while rotenone is being applied and thereafter for a precautionary period, about 4-5 days total. During the proposed treatments, cattle would be moved off of riparian areas to uplands or untreated riparian areas.

Comment 2m: MFWP would apply rotenone under the Montana Dept. of Environmental Quality (DEQ) General Permit for Pesticide Application (#MTG87000). A Notice of Intent was accepted by the Department of Environmental Quality. The NOI included the waters proposed in this EA. A letter was received from DEQ dated August 13, 2012 recognizing the Notice of Intent and allowing MFWP to operate under the General Permit for Pesticide Application.

Cumulative Impacts: The proposed action of piscicide treatment would have a short term impact on water quality and potentially a longer term impact on invertebrate species community composition. These impacts would attenuate through time and would not impact fisheries productivity after restocking. Another potential restoration project is being considered in Carpenter Creek (mining district near Neihart, MT). The Carpenter Creek project would not require the use of piscicides. A barrier may be constructed on Carpenter Creek with associated impacts being short term and spatially limited. As such, we do not foresee any cumulative impacts from additional projects in the immediate area of Dry fork Belt Creek. Stocking of native WCT would not have any impacts on this resource category.

3. AIR	IMPACT	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
Will the proposed action result in:	Unknown					
a. Emission of air pollutants or deterioration of ambient air quality? (also see 13 (c))			X			3a
b. Creation of objectionable odors?			X		Yes	3b
c. Alteration of air movement, moisture, or temperature patterns or any change in climate, either locally or regionally?		X				
d. Adverse effects on vegetation, including crops, due to increased emissions of pollutants?		X				
e. Will the project result in any discharge which will conflict with federal or state air quality regs?		X				

Comment 3a: An approximately 2 mile long reach of Dry Fork Creek would be dry downstream of the treated stream during rotenone applications. Piscicide treatment would only occur when these stream reaches are dry. A backup system for detoxification of rotenone would be available in the unlikely circumstance of a large unexpected rainfall event followed by surface water flows

in Dry Fork Creek. Under this scenario, a gasoline generator would be used to run a power auger at the lower end of the treatment area to dispense powdered potassium permanganate (detoxifying agent). The generator would produce some exhaust fumes that would dissipate rapidly.

Comment 3b: CFT Legumine does not contain the same level of aromatic petroleum solvents (toluene, xylene, benzene and naphthalene) of other rotenone formulations (i.e. Prenfish) and as a consequence does not have the same odor concerns and has less inhalation risks. If Prenfish were to be used, objectionable odors from aromatic petroleum solvents would dissipate rapidly and would only be noticeable to workers carrying out the treatment.

Previous treatments have shown fish decay rapidly and are difficult to find even after a few days post treatment. Despite this rapid decay, there may be a noxious dead fish smell for several days post treatment. Previous studies have shown that over 80% of dead fish will not rise to the surface of pools, limiting exposure to air and reducing noxious smells (Bradbury 1986).

Cumulative Impacts: Impacts to air quality from the proposed action would be short term and minor. We do not expect the proposed action to result in other actions that would create cumulative impacts to air quality in Dry Fork Creek.

4. <u>VEGETATION</u>	IMPACT	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
Will the proposed action result in:	Unknown					
a. Changes in the diversity, productivity or abundance of plant species (including trees, shrubs, grass, crops, and aquatic plants)?			X			4a
b. Alteration of a plant community?		X				
c. Adverse effects on any unique, rare, threatened, or endangered species?		X				
d. Reduction in acreage or productivity of any agricultural land?		X				
e. Establishment or spread of noxious weeds?		X				
f. Will the project affect wetlands, or prime and unique farmland?		X				

Comment 4a: During piscicide treatment, workers would access drip stations on Dry Fork Creek, by overland hiking, and by trail. There would be some trampling of vegetation along the stream during the placement and monitoring of drip stations and sentinel fish locations. Rotenone does not have an effect on plants at concentrations used to kill fish. Impacts from trampling of vegetation are expected to be short term and minor.

Cumulative Impacts: Impacts to vegetation from the proposed action would be short term and minor. We do not expect the proposed action to result in other actions that would create

cumulative impacts to vegetation in Dry Fork Creek. We predict that the new WCT fishery would not increase public use from present levels. Thus, we foresee no cumulative impacts to vegetation from the proposed action.

5. FISH/WILDLIFE	IMPACT	None	Minor	Potentially	Can	Comment
Will the proposed action result in:	Unknown			Significant	Impact Be	Index
					Mitigated	
a. Deterioration of critical fish or wildlife habitat?		X				
b. Changes in the diversity or abundance of game animals or bird species?			X		Yes	5b
c. Changes in the diversity or abundance of nongame species?			X			5c
d. Introduction of new species into an area?			X			5d
e. Creation of a barrier to the migration or movement of animals?		X				
f. Adverse effects on any unique, rare, threatened, or endangered species?	X					5f
g. Increase in conditions that stress wildlife populations or limit abundance (including harassment, legal or illegal harvest or other human activity)?		X				5g
h. Will the project be performed in any area in which T&E species are present, and will the project affect any T&E species or their habitat? (Also see 5f)			X			5h
i. Will the project introduce or export any species not presently or historically occurring in the receiving location? (Also see 5d)	X					5i

Comment 5b: This project is designed to kill non-native fish. Historically, Dry Fork Creek would have supported a non-hybridized population of native WCT.

The abundance of WCT in Dry Fork Creek should reach pre-project levels - i.e. current brook trout and rainbow trout abundance – within 5 to 7 years. After the proposed piscicide treatment, native WCT would naturally recolonize mainstem Dry Fork Creek in a downstream direction. MFWP would initiate efforts to speed up this process by transferring either eyed-eggs or juvenile and adult fish over a three to five year period. Prior to movement of native WCT, all transfers would be subject to approval by the MFWP Fish Health Committee. Donor populations would be tested for disease and genetic purity. *To mitigate for the short term loss of fishing opportunity in mainstem Dry Fork, MFWP plans to stock sterile hatchery WCT near popular fishing areas in Dry Fork Creek.* These stocking efforts would continue until a sustainable natural WCT fishery is developed in Dry Fork Creek. *The upper reaches of Dry Fork Belt Creek support both brook trout and WCT. An effort will be made to rescue WCT should the*

preferred alternative be selected. Native WCT would be collected by electrofishing and moved upstream of the treatment area.

Comment 5c: There is some evidence that non-native brook trout populations exhibit greater densities and biomass than native populations of cutthroat trout (Benjamin and Baxter 2012). However, it appears that the majority of increased production in replaced cutthroat populations is contributed by earlier age classes (Benjamin and Baxter 2010). Several authors (Benjamin et al. 2011; Lepori et al. 2012) have also shown that brook trout and cutthroat trout, though both salmonines, may be functionally different predators with differing impacts on trophic subsidies with brook trout showing increased rates of consumption of some species of invertebrates. However, decreases in overall densities of invertebrates in streams with brook trout rather than cutthroat trout were not detectable (Lepori 2012).

Comment 5d: The project is within the historical range of WCT.

Aquatic Invertebrates:

In general, most studies report that aquatic invertebrates, excepting zooplankton are much less sensitive to rotenone treatment than fish (Schnick 1974). One study reported that no significant reduction in aquatic invertebrates was observed due to the effects of rotenone, which was applied at levels twice as high as the levels proposed for this project (Houf and Campbell 1977). In all cases, the reduction of aquatic invertebrates was temporary, and most treatments used a higher concentration of rotenone than proposed for this project (Schnick 1974). In a study on the relative tolerance of different aquatic invertebrates to rotenone, Engstrom-Heg et al. (1978) reported that the long-term impacts of rotenone are mitigated because those insects that were most sensitive to rotenone also tended to have the highest rates of recolonization. Because of their short life cycles (Anderson and Wallace 1984), good dispersal ability (Pennack 1989), and generally high reproductive potential (Anderson and Wallace 1984), aquatic invertebrates are capable of rapid recovery from disturbance (Boulton et al. 1992; Matthaei et al. 1996). In northcentral Montana, aquatic invertebrates have been routinely collected prior to transfers of WCT to fishless habitats (Petty Creek, N. Fk. Ford Creek, Lonesome Creek, Lange Creek etc.). Most invertebrates collected prior to transfers were commonly found throughout Montana and in no cases were rare or endangered species of invertebrates discovered (Daniel Gustafson *personal communication*). These collections, in high elevation, remote stream reaches, indicate that the probability of eliminating a rare or endangered species in Dry Fork Creek with the application of rotenone is unlikely. Headwater reaches of Dry Fork Creek upstream of natural fish barriers that do not hold fish would not be treated with piscicides and would provide a source of aquatic invertebrate colonists. In addition, recolonization would include aerially dispersing invertebrates from downstream areas of Dry Fork Creek (e.g. mayflies, caddisflies). The proximity of source areas should aid in rapid recovery of the Dry Fork Creek aquatic community. The aquatic invertebrate community *structure* in Dry Fork Creek may be temporarily affected by the treatment (i.e. ratio of gilled to non-gilled invertebrates). Naturally caused (e.g. fire) and anthropogenic (e.g. livestock grazing) disturbances also impact the structure of aquatic invertebrate communities (Wohl and Carline 1996; Mihuc and Minshall 2005; Minshall 2003). Moreover, natural fire caused changes in trophic dominance may last greater than 15 years because of post fire changes to stream geomorphology and riparian species composition (Minshall 2003). Use of piscicides temporarily changes the ratio of certain invertebrate species;

this is likely less impactful to aquatic invertebrate communities than long term physical changes to the stream/riparian interface from excessive livestock grazing, clear-cut logging, or natural catastrophic fires and floods.

Mammals, Birds, and Amphibians:

Mammals are generally not affected because they neutralize rotenone by enzymatic action in their stomach and intestines (AFS 2002). Laboratory tests by Marking (1988) involved feeding a form of rotenone to rats and dogs as part of their diet for periods of six months to two years and observing effects such as diarrhea, decreased food consumption, and weight loss. He reported that despite unusually high treatment concentrations of rotenone in rats and dogs, it did not cause tumors or reproductive problems in mammals. Studies of risk for terrestrial animals found that a 22 pound dog would have to drink 7,915 gallons of treated lake water within 24 hours, or eat 660,000 pounds of rotenone-killed fish, to receive a lethal dose (CDFG 1994). The State of Washington reported that a half pound mammal would need to consume 12.5 mg of pure rotenone to receive a lethal dose (Bradbury 1986). Considering the only conceivable way an animal can consume the compound under field conditions is by drinking lake or stream water, a half-pound animal would need to drink 33 gallons of water treated at 2 ppm.

The EPA (2007) made the following conclusion for small mammals and large mammals;

*When estimating daily food intake, an intermediate-sized 350 g mammal will consume about 18.8 g of food. Using data previously cited from the common carp with a body weight of 88 grams, a small mammal would only consume 21% (18.8/88) of the total carp body mass. According to the data for common carp, total body residues of rotenone in carp amounted to 1.08 µg/g. A 350-g mammal consuming 18.8 grams represents an equivalent dose of 20.3 µg of rotenone; this value is well below the median lethal dose of rotenone (39.5 mg/kg * 0.350 kg = 13.8 mg = 13,800 µg) for similarly sized mammals. When assessing a large mammal, 1000 g is considered to be a default body weight. A 1000 g mammal will consume about 34 g of food. If the animal fed exclusively on carp killed by rotenone, the equivalent dose would be 34 g * 1.08 µg/g or 37 µg of rotenone. This value is below the estimated median lethal equivalent concentration adjusted for body weight (30.4 mg/kg * 1 kg = 30.4 mg = 30,400 µg). Although fish are often collected and buried to the extent possible following a rotenone treatment, even if fish were available for consumption by mammals scavenging along the shoreline for dead or dying fish, it is unlikely that piscivorous mammals will consume enough fish to result in observable acute toxicity.*

One study, in which rats were injected with rotenone for a period of weeks, reported finding lesions characteristic of Parkinson's disease (Betarbet et al. 2000). However, the results have been challenged on the basis of methodology: (1) that the continuous intravenous injection method used leads to "continuously high levels of the compound in the blood," and (2), that dimethyl sulfoxide (DMSO) was used to enhance tissue penetration (normal routes of exposure actually slow introduction of chemicals into the bloodstream). Finally, injecting rotenone into the body is not a realistic way of assimilating the compound. Similar studies (Marking 1988) have found no Parkinson-like results. Extensive research has demonstrated that rotenone does not cause birth defects (HRI 1982), gene mutations (Van Geothem et al. 1981; BRL 1982) or

cancer (Marking 1988). Rotenone was found to have no direct role in fetal development of rats that were fed excruciatingly high concentrations of rotenone. Spencer and Sing (1982) reported that rats that were fed diets laced with 10-1000 ppm rotenone over a 10 day period did not suffer any reproductive dysfunction. Typical concentrations of actual rotenone used in fishery management range from 0.025 to 0.50 ppm and are far below that administered during most toxicology studies.

Similar results determined that birds required levels of rotenone at least 1,000 to 10,000-times greater than is required for lethality in fish (Skaar 2001). Cutkomp (1943) reported that chickens, pheasants and other members of lower orders of *Galliformes* were quite resistant to rotenone, and four day old chicks were more resistant than adults. Ware (2002) reports that swine are uniquely sensitive to rotenone and it is slightly toxic to wildfowl, but to kill Japanese quail required 4,500 to 7,000 times more than is used to kill fish.

The EPA (2007) made the following conclusion for birds;

*Since rotenone is applied directly to water, there is little likelihood that terrestrial forage items for birds will contain rotenone residues from this use. While it is possible that some piscivorous birds may feed opportunistically on dead or dying fish located on the surface of treated waters, protocols for piscicidal use typically recommend that dead fish be collected and buried, rendering the fish less available for consumption (see Section IV). In addition, many of the dead fish will sink and not be available for consumption by birds. However, whole body residues in fish killed with rotenone ranged from 0.22 µg/g in yellow perch (*Perca flavescens*) to 1.08 µg/g in common carp (*Cyprinus carpio*) (Jarvinen and Ankley 1998). For a 68 g yellow perch and an 88 g carp, this represents totals of 15 µg and 95 µg rotenone per fish, respectively. Based on the avian subacute dietary LC_{50} of 4110 mg/kg, a 1000-g bird would have to consume 274,000 perch or 43,000 small carp. Thus, it is unlikely that piscivorous birds will consume enough fish to result in a lethal dose.*

Also, if temporary reductions in aquatic invertebrates occur, insectivorous species such as American dipper (Cinclus mexicanus), may be impacted to the extent that they rely on aquatic invertebrates for food. Aquatic invertebrate communities typically recover rapidly from disturbance and impacted birds and mammals are mobile and would likely emigrate to nearby habitats until full recovery of the aquatic community.

Chandler and Marking (1982) found that clams and snails were between 50 and 150 times more tolerant than fish to Noxfish (5% rotenone formulation), and southern leopard frog tadpoles were between 3 and 10 times more tolerant than fish. Grisak et al. (2007) conducted laboratory studies on long toed salamanders, Rocky Mountain tailed frogs, and Columbia spotted frogs and concluded that the adults of these species would not suffer an acute response to Prenfish at trout killing concentrations (0.5-1 mg/L) but the larvae would likely be affected. These authors recommended implementing rotenone treatments at times when the larvae are not present, such as the fall, to reduce the chance of exposure to rotenone treated water and potential impacts to larval amphibians.

It is important to note that many toxicity studies involve subjecting laboratory specimens to unusually high concentrations of rotenone, or conducting tests on animals that would not normally be exposed to rotenone during use in fisheries management. Based on this information we would expect the impacts to non-target organisms to range from non-existent to short term and minor.

Comment 5d: The proposed project is within the historically identified range of WCT.

Comment 5f: The proposed project area is within the range of Boreal chorus frog (*Pseudacris maculate*), Columbia spotted frog, (*Rana luteiventris*), long-toed Salamander (*Ambystoma macrodactylum*), Rocky Mountain tailed frog (*Ascaphus montanus*), and western toad (*Anaxyrus boreas*). Columbia spotted frog are known to occur in the upper reaches of Dry Fork Creek (Natural Heritage Database; 2/15/2013). The areas where rotenone use is proposed in this project are primarily running water. Most amphibian larvae (tadpoles) would have already undergone metamorphosis to the less vulnerable adult stage when the proposed stream treatment would occur (i.e. summer months).

Some sensitive or potentially sensitive species that may infrequently use the area and could potentially ingest dead fish, include, fisher (*Martes pennanti*), wolverine (*Gulo gulo*), hoary marmot (*Marmota caligata*), bald eagle (*Haliaeetus leucocephalus*), Boreal owl (*Aegolius funereus*), golden eagle (*Aquila chrysaetos*), great gray owl (*Strix nebulosa*), northern goshawk (*Accipiter gentilis*), northern hawk owl (*Surnia ulula*), and short-eared owl (*Asio flammeus*). None of these species would be affected by ingestion of dead fish (see Comment 5c). Management indicator species that may infrequently use the area and could ingest fish, include, black bear, mountain lion, and bobcat. None of these species would be affected by ingestion of dead fish (see comment 5c).

Comment 5g: During rotenone treatments there will be an increase in foot traffic along established trails and some off trail foot traffic by agency personnel.

Comment 5h: Bald eagles (*Haliaeetus leucocephalus*) nest almost exclusively in live trees, usually within one mile in line of sight of a large river or lake. Bald eagles may occur in the project area seasonally. The bald eagle is an opportunistic predator and feeds primarily on fish, but also consumes a variety of birds and mammals (both dead and alive) when fish are scarce or these other species are readily available. Fish may comprise up to 90 percent of the diet (70 percent to 90 percent), depending on geographic location, season, and relative abundance (FWS 1996). Impacts on the bald eagle would include temporary increases in noise and human disturbance associated with the piscicide treatment process and transportation of materials, equipment, and staff to and from treatment areas. In some cases, bald eagles might be attracted by the presence of dead fish. No impacts on the bald eagle would be anticipated as a result of possible consumption of contaminated fish and/or water. No loss of bald eagle habitat would result from the proposed project. There would be a temporary reduction in the availability of fish as a food source in the the Dry Fork Creek drainage. Dry Fork Creek is not a focal area for bald eagles and a temporary lack of fish in the area would have little or no impact on bald eagles residing in the general area. There are numerous alternate food sources that bald eagle can rely on in these areas, including sources located in nearby lakes and rivers.

Canada lynx (*Lynx canadensis*) have been identified in the Dry Fork drainage (Natural Heritage Database; 2/15/2013) . Impacts on the Canada lynx would include temporary increases in noise and human disturbance associated with the piscicide treatment process and transportation of materials, equipment, and personnel to and from treatment sites. One to three treatments with rotenone are proposed over three consecutive years. Rotenone applications would take place after spring snowmelt and before big game hunting season with the preferred treatment period from mid-July to late August. Increases in noise and human disturbance would last approximately 6 days: one day for set-up, 4 days to treat, and at least one day for clean up. The number of trips needed to deliver materials, equipment, and personnel would vary depending on the method of transport. The presence of humans could displace Canada lynx from the project area during the treatment process. No loss of Canada lynx habitat or prey items would result from the proposed actions. No impacts on Canada lynx are anticipated to result from possible consumption of contaminated fish and/or water. In addition, no indirect impacts on Canada lynx would be expected as a result of the temporary absence of fish in Dry Fork Creek.

Comment 5i: Dry Fork of Belt Creek is within the historical range of westslope cutthroat trout.

Cumulative Impacts: Impacts to fish and wildlife from the proposed action would be short term and minor. We do not expect the proposed action to result in other actions that would create cumulative impacts to fish and wildlife resources in Dry Fork Creek. Dry Fork Creek is an area of intense recreational use. Based on recreational use patterns of other WCT fisheries we would conclude that it is very unlikely that the new WCT fishery would attract significant interest and associated higher use levels. The current fishery would be replaced by a WCT fishery that occupies a similar niche and would provide similar ecological functions. As such there are no cumulative impacts to non-target organisms related to treatment of Dry Fork Creek with piscicides.

B.HUMAN ENVIRONMENT

6. NOISE/ELECTRICAL EFFECTS	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
Will the proposed action result in:						
a. Increases in existing noise levels?			X			6a
b. Exposure of people to serve or nuisance noise levels?		X				
c. Creation of electrostatic or electromagnetic effects that could be detrimental to human health or property?		X				
d. Interference with radio or television reception and operation?		X				

Comment 6a: During piscicide treatment there would be increased traffic and presence of agency personnel. In the unlikely event that detoxification with potassium permanganate is

required, the use of a small generator to power a dry solid volumetric feeder. Noise from the generator should attenuate rapidly a short distance from the fixed detoxification zone.

Cumulative Impacts: Increases in vehicle traffic and presence of agency personnel from the proposed action would be short term but widespread throughout the Dry Fork drainage. We do not expect the proposed action to result in other actions that would create increased noise in the Dry Fork stream corridor. A separate barrier project may be proposed in the Carpenter Creek drainage. This project if it were to proceed would be implemented several years after the proposed project.

7. LAND USE	IMPACT	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
Will the proposed action result in:	Unknown					
a. Alteration of or interference with the productivity or profitability of the existing land use of an area?			X			7a
b. Conflicted with a designated natural area or area of unusual scientific or educational importance?		X				
c. Conflict with any existing land use whose presence would constrain or potentially prohibit the proposed action?			X		Yes	7c
d. Adverse effects on or relocation of residences?		X				

Comment 7a: This project would impact anglers that fish for and harvest brook trout. Currently, regulations allow harvest of 20 brook trout per day in Dry Fork Creek. WCT regulations specify catch and release only. If the proposed action is successful Dry Fork Creek WCT populations should reach harvestable levels within 5 to 7 years. MFWP plans a change in regulations allowing limited harvest of WCT. Moreover, MFWP is planning on stocking sterile WCT obtained from the Washoe Park Fish Hatchery (M012) immediately after rotenone treatments to provide a recreational fishery. These fish should attain catchable sizes one to 2 years after being stocked. MFWP will also consider a limited harvest of these sterile WCT.

Profitability of grazing on national forest lands or private lands should not be affected. Some herding of cattle out of riparian areas may be necessary during the proposed piscicide applications. Moreover, if there are feasibility issues with moving cattle out of riparian areas, treatments would be scheduled when livestock are pastured elsewhere (i.e. late summer and early fall). Current USFS livestock management plans would not be altered because of WCT re-introduction efforts.

Comment 7c: Trail systems within the Dry Fork Creek drainage are used by hikers, horsemen, ATV, dirt bike riders, hunters, and anglers. The proposed project would be scheduled mid-week to avoid conflicts with weekend recreational use. At proposed treatment levels, stream water would not be toxic to wildlife or livestock. However, to limit any potential conflict, the

treatment would be planned when livestock are pastured elsewhere or livestock would be temporarily moved to adjacent upland habitats or un-treated areas of Dry Fork Creek.

Cumulative Impacts: Impacts on land use from the proposed action would be short term and minor. We do not expect the proposed action to result in other actions that would impact land use in the Dry Fork Creek stream corridor. We do not foresee any other activities in the basin that would add to impacts of the proposed action. As such there are no cumulative impacts related to land use from the proposed action of rotenone treatment and restoration of WCT in Dry Fork Creek.

8. <u>RISK/HEALTH HAZARDS</u>	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
Will the proposed action result in:						
a. Risk of an explosion or release of hazardous substances (including, but not limited to oil, pesticides, chemicals, or radiation) in the event of an accident or other forms of disruption?			X		Yes	8a
b. Affect an existing emergency response or emergency evacuation plan or create a need for a new plan?			X		Yes	8b
c. Creation of any human health hazard or potential hazard?			X		Yes	see 8ac
d. Will any chemical toxicants be used?			X		Yes	see 8a

Comment 8a: The principal risk of human exposure to hazardous materials from this project would be limited to the applicators of the rotenone fish toxicant (CFT Legumine or equivalent). All applicators would wear safety equipment required by the product labels and MSDS (Material Safety Data) sheets such as respirator, goggles, rubber boots, Tyvek overalls, and nitrile gloves. All applicators would be trained on the safe handling and application of the piscicide. Personnel responsible for application of the detoxifying agent (potassium permanganate) would also be trained on its safe handling and application. At least one, and most likely several, Montana Department of Agriculture certified pesticide applicators would supervise and administer the project. Materials would be transported, handled, applied, and stored according to the label specifications to reduce the probability of human exposure or spill.

Comment 8b: MFWP requires a treatment plan for rotenone projects. This plan addresses many aspects of safety for people who are on the implementation team such as establishing a clear chain of command, training, delegation and assignment of responsibility, clear lines of communication between members, spill contingency plans, first aid, emergency responder information, personal protective equipment, monitoring and quality control, among others. Implementing this project should not have any impact on existing emergency plans. Because an implementation plan has been developed by MFWP the risk of emergency response is minimal and any affects to existing emergency responders would be short term and minor.

Comment 8c: The EPA (2007) conducted an analysis of the human health risks for rotenone and concluded it has a high acute toxicity for both oral and inhalation routes, but has a low acute toxicity for dermal route of exposure. It is not an eye or skin irritant nor a skin sensitizer. The EPA could not provide a quantitative assessment of potentially critical effects on neurotoxicity risks to rotenone users, so a number of uncertainty factors were assigned to the rating values. They are: an additional 10x database uncertainty factor - in addition to the inter-species (10x) uncertainty factor an intra-species (10x) uncertainty factor – has been applied to protect against potential human health effects and the target margin of exposure (MOE) is 1,000. The following table summarizes the EPA toxicological endpoints of rotenone (from EPA 2007):

Exposure Scenario	Dose Used in Risk Assessment, Uncertainty Factor (UF)	Level of Concern for Risk Assessment	Study and Toxicological Effects
Acute Dietary (females 13-49)	NOAEL = 15 mg/kg/day UF = 1000 aRfD = <u>15 mg/kg/day</u> = 0.015 mg/kg/day 1000	Acute PAD = 0.015 mg/kg/day	Developmental toxicity study in mouse (MRID 00141707, 00145049) LOAEL = 24 mg/kg/day based on increased resorptions
Acute Dietary (all populations)	An appropriate endpoint attributable to a single dose was not identified in the available studies, including the developmental toxicity studies.		
Chronic Dietary (all populations)	NOAEL = 0.375 mg/kg/day UF = 1000 cRfD = <u>0.375 mg/kg/day</u> = 0.0004 mg/kg/day 1000	Chronic PAD = 0.0004 mg/kg/day	Chronic/oncogenicity study in rat (MRID 00156739, 41657101) LOAEL = 1.9 mg/kg/day based on decreased body weight and food consumption in both males and females
Incidental Oral Short-term (1-30 days) Intermediate-term (1-6 months)	NOAEL = 0.5 mg/kg/day	Residential MOE = 1000	Reproductive toxicity study in rat (MRID 00141408) LOAEL = 2.4/3.0 mg/kg/day [M/F] based on decreased parental (male and female) body weight and body weight gain
Dermal Short-, Intermediate-, and Long-Term	NOAEL = 0.5 mg/kg/day 10% dermal absorption factor	Residential MOE = 1000 Worker MOE = 1000	Reproductive toxicity study in rat (MRID 00141408) LOAEL = 2.4/3.0 mg/kg/day
Inhalation Short-term (1-30 days) Intermediate-term (1-6 months)	NOAEL = 0.5 mg/kg/day 100% inhalation absorption factor	Residential MOE = 1000 Worker MOE = 1000	[M/F] based on decreased parental (male and female) body weight and body weight gain
Cancer (oral, dermal, inhalation)	Classification; No evidence of carcinogenicity		

UF = uncertainty factor, NOAEL = no observed adverse effect level, LOAEL = lowest observed adverse effect level, aPAD = acute population adjusted dose, cPAD = chronic population adjusted dose, RfD = reference dose, MOE = margin of exposure, NA = Not Applicable

Rotenoloids are common degradation products found in the parent plant material used to make piscicidal forms of rotenone. The EPA (2007) concluded these degradation products are no more toxic than the active ingredient.

The EPA analysis of acute dietary risk for both food and drinking water concluded;

When rotenone is used in fish management applications, food exposure may occur when individuals catch and eat fish that either survived the treatment or were added to the water body (restocked) prior to complete degradation. Although exposure from this route is unlikely for the general U.S. population, some people might consume fish following a rotenone application. EPA used maximum residue values from a bioaccumulation study to estimate acute risk from consuming fish from treated water bodies. This estimate is considered conservative because the bioaccumulation study measured total residues in edible portions of fish including certain non-edible portions (skin, scales, and fins) where concentrations may be higher than edible portions (tissue) and the Agency assumed that 100% of fish consumption could come from rotenone exposed fish. In addition, fish are able to detect rotenone's presence in water and, when possible, attempt to avoid the chemical by moving from the treatment area. Thus, for partial kill uses, surviving fish are likely those that have intentionally minimized exposure.

Acute exposure estimates for drinking water considered surface water only because rotenone is only applied directly to surface water and is not expected to reach groundwater. The estimated drinking water concentration (EDWC) used in dietary exposure estimates was 200 ppb, the solubility limit of rotenone. The drinking water risk assessment is conservative because it assumes water is consumed immediately after treatment with no degradation and no water treatment prior to consumption.

Acute dietary exposure estimates result in dietary risk below the Agency's level of concern. Generally, EPA is concerned when risk estimates exceed 100% of the acute population adjusted dose (aPAD). The exposure for the "females 13-49 years old" subgroup (0.1117 mg/kg/day) utilized 74% of the aPAD (0.015 mg/kg/day) at the 95th percentile (see Table). It is appropriate to consider the 95th percentile because the analysis is deterministic and unrefined. Measures implemented as a result of this RED will further minimize potential dietary exposure (see Section IV).

As for evaluating the human chronic risk from exposure to rotenone treated water, the EPA acknowledges the four principle reasons for concluding there is a low risk. First, the rapid natural degradation of rotenone. Second, using active detoxification measures by applicators such as potassium permanganate. Next, properly following piscicide labels which prohibit the use near water intakes. Finally, proper signing, public notification or area closures which limit public exposure to rotenone treated water.

As for recreational exposure, the EPA concludes no risk to adults who enter treated water following the application from dermal and incidental ingestion, but requires a waiting period of 3

days after a treatment before toddlers swim in treated water. The aggregate risk to human health from food, water and swimming does not exceed the EPA level of concern (EPA 2007). Recreationists in the area would likely not be exposed to the treatments because a temporary closure would preclude many from being in the area. Proper warning through news releases, signing the project area, road closure and administrative personnel in the project area should be adequate to keep unintended recreationists from being exposed to any treated waters.

Fisher (2007) conducted an analysis of the inert constituent ingredients found in the rotenone formulation of CFT Legumine for the California Department of Fish and Game. These inert ingredients are principally found in the emulsifying agent Fennodefo⁹⁹ which helps make the generally insoluble rotenone more soluble in water. The constituents were considered because of their known hazard status and not because of their concentrations in the CFT Legumine formulation. Solvents such as xylene, trichloroethylene (TCE) and tetrachloroethylene are residue left over from the process of extracting rotenone from the root and can be found in some lots of CFT Legumine. However, inconsistent detectability and low occurrence in other formulations that used the same extraction process were below the levels for human health and ecological risk. Solvents such as toluene, *n*-butylbenzene, 1,2,4 trimethylbenzene and naphthalene are present in CFT Legumine, and when used in other applications can be an inhalation risk. However, because of their low concentrations in this formulation, the human health risk is low. The remaining constituents, the fatty acid esters, resin acids, glycols, substituted benzenes, and 1-hexanol were likewise present but either, analyzed, calculated or estimated to be below the human health risk levels when used in a typical fish eradication project.

Methyl pyrrolidone is also found in CFT Legumine. It is known to have good solvency properties and is used to dissolve a wide range of compounds including resins (rotenone). Analysis of methyl pyrrolidone in CFT Legumine showed it represents about 9% of the formulation (Fisher 2007). The analysis by Fisher (2007) concluded the following regarding the constituent ingredients in CFT Legumine:

...None of the constituents identified are considered persistent in the environment nor will they bioaccumulate. The trace benzenes identified in the solvent mixture of CFT Legumine™ will exhibit limited volatility and will rapidly degrade through photolytic and biological degradation mechanisms. The PEGs are highly soluble, have very low volatility, and are rapidly biodegraded within a matter of days. The fatty acids in the fatty acid ester mixture (Fennodefo99™) do not exhibit significant volatility, are virtually insoluble, and are readily biodegraded, although likely over a slightly longer period of time than the PEGs in the mixture. None of the new compounds identified exhibit persistence or are known to bioaccumulate. Under conditions that would favor groundwater exchange the highly soluble PEGs could feasibly transmit to groundwater, but the concentrations in the reservoir, and the rapid biodegradation of these constituents makes this scenario extremely unlikely. Based upon a review of the physical chemistry of the chemicals identified, we conclude that they are rapidly biodegraded, hydrolyzed and/or otherwise photolytically oxidized and that the chemicals pose no additional risk to human health or ecological receptors from those identified in the earlier analysis. None of the constituents identified appear to be at concentrations that

suggest human health risks through water, or ingestion exposure scenarios and no relevant regulatory criteria are exceeded in estimated exposure concentrations...

The CFT Legumine MSDS states "...when working with an undiluted product in a confined space, use a non-powered air purifying respirator...and... air-purifying respirators do not protect workers in oxygen-deficient atmospheres..." It is not likely that workers would be handling CFT Legumine in an oxygen deficient space during normal use. However, to guard against this, proper ventilation and safety equipment would be used according to the label requirements.

The advantage of CFT Legumine over Prenfish is that it has less petroleum hydrocarbon solvents such as toluene, xylene, benzene and naphthalene. By comparison, Prenfish has a strong chemical odor. CFT Legumine is virtually odor-free and performs almost identically to Prenfish.

In their description of how South American Indians prepare and apply *Timbó*, a rotenone parent plant, Teixeira et al. (1984) reported that the Indians extensively handled the plants during a mastication process, and then swam in lagoons to distribute the plant pulp. No harmful effects were reported. It is important to note that the primitive method of applying rotenone from root does not involve a calculated target concentration, metering devices, or involve human health risk precautions as those involved with fisheries management programs.

A recent study linked the use of rotenone and paraquat with the development of Parkinson's disease (PD) in humans later in life (Tanner et al. 2011). The after the fact study included mostly farmers from 2 states within the United States who presumably used rotenone for terrestrial application to crops and/or livestock. Rotenone is no longer approved for agricultural uses and is only approved for aquatic application as a piscicide. The results of epidemiological studies of pesticide exposure, such as this one have been highly variable (Guenther et al. 2011). Studies have found no correlations between pesticide exposure and PD (e.g., Jiménez-Jiménez 1992; Hertzman 1994; Engel et al. 2001; Firestone et al. 2010), some have found correlations between pesticide exposure and PD (e.g., Hubble et al. 1993; Lai et al. 2002; Tanner et al. 2011) and some have found it difficult to determine which pesticide or pesticide class is implicated if associations with PD occur (e.g., Engel et al. 2001; Tanner et al. 2009). Recently, epidemiological studies linking pesticide exposure to PD have been criticized due to the high variation among study results, generic categorization of pesticide exposure scenarios, questionnaire subjectivity, and the difficulty in evaluating the causal factors in the complex disease of PD, which may have multiple causal factors (age, genetics, environment) (Raffaele et al. 2011). A specific concern is the inability to assess the degree of exposure to certain chemicals, including rotenone, particularly the concentration of the chemical, frequency of use, application (e.g., agricultural, insect removal from pets), and exposure routes (Raffaele et al. 2011). No information is given in the Tanner et al. (2011) study about the formulation of rotenone used (powder or liquid) or the frequency or dose farmers were exposed to during their careers. There is also no information given about the personal protective equipment used or any information about other pesticides farmers were exposed to during the period of the study. It is also unclear in the Tanner et al. (2011) study the frequency and the dose individuals were exposed to during the time period of use. Without information on how much rotenone

individuals were exposed to and for how long, it is difficult to evaluate the potential risk to humans of developing Parkinson's disease from aquatic applications of rotenone products.

The state of Arizona conducted an exhaustive review to the risks to human health of rotenone use as a piscicide (Guenther et al. 2011). They concluded: "To date, there are no published studies that conclusively link exposure to rotenone and the development of clinically diagnosed PD. Some correlation studies have found a higher incidence of PD with exposure to pesticides among other factors, and some have not. It is very important to note that in case-control correlation studies, causal relationships cannot be assumed and some associations identified in odds-ratio analyses may be chance associations. Only one study (Tanner et al. 2011) found an association between rotenone and paraquat use and PD in agricultural workers, primarily farmers. However, there are substantial differences between the methods of application, formulation, and doses of rotenone used in agriculture and residential settings compared with aquatic use as a piscicide, and the agricultural workers interviewed were also exposed to many other pesticides during their careers. Through the EPA re-registration process of rotenone, occupational exposure risk is minimized by: new requirements that state handlers may only apply rotenone at less than the maximum treatment concentrations (200 ppb), the development of engineering controls to some of the rotenone dispensing equipment, and requiring handlers to wear specific PPE."

It is clear that to reduce or eliminate the risk to human health, including any potential risk of developing Parkinson's disease, public exposure to rotenone treated water must be eliminated to the extent possible. To reduce the potential for exposure of the public during the proposed use of CFT Legumine to restore WCT, areas treated with rotenone would be closed to public access during the treatment. Signs would be placed at access points informing the public of the closure and the presence rotenone treated waters. Personnel would be onsite to inform the public and escort them from the treatment area should they enter. Rotenone treated waters would be contained to the proposed treatment areas by over 1 mile of dry channel and if necessary, adding potassium permanganate to the stream at the downstream end of the treatment reach, either at the fish barrier or downstream where the stream re-surfaces. Potassium permanganate would neutralize any remaining rotenone before leaving the project area. The efficacy of the neutralization would be monitored using fish (the most sensitive species to the chemical) and a hand held chlorine meter. Therefore, the potential for public exposure to rotenone treated waters is very minimal. The potential for exposure would be greatest for those government workers applying the chemical. To reduce their exposure, all CFT Legumine label mandates for personal protective equipment would be adhered to (see Comment 8a).

Cumulative Impacts: Health hazards from the proposed action would be short term and mitigated through use of proper safety equipment, etc. Only EPA registered piscicides would be used - EPA label directions and supplementary MFWP piscicide policies would be followed and overseen by an independent pesticide applicator. We do not expect the proposed action to result in other actions that would increase the risk of health hazards in the Dry Fork Creek stream corridor. We do not foresee any other activities in the basin that would add to health impacts of the proposed action. A potential separate project in the Carpenter Creek drainage would be implemented several years after the proposed project. The Carpenter Creek project would not require the use of piscicides and thus would not lead to cumulative impacts from piscicide application.

9. COMMUNITY IMPACT	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
Will the proposed action result in:						
a. Alteration of the location, distribution, density, or growth rate of the human population of an area?		X				
b. Alteration of the social structure of a community?		X				
c. Alteration of the level or distribution of employment or community or personal income?		X				
d. Changes in industrial or commercial activity?		X				
e. Increased traffic hazards or effects on existing transportation facilities or patterns of movement of people and goods?		X				

10. PUBLIC SERVICES/TAXES/UTILITIES	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
Will the proposed action result in:						
a. Will the proposed action have an effect upon or result in a need for new or altered governmental services in any of the following areas: fire or police protection, schools, parks/recreational facilities, roads or other public maintenance, water supply, sewer or septic systems, solid waste disposal, health, or other governmental services? If any, specify:			X			10a
b. Will the proposed action have an effect upon the local or state tax base and revenues?		X				
c. Will the proposed action result in a need for new facilities or substantial alterations of any of the following utilities: electric power, natural gas, other fuel supply or distribution systems, or		X				

communications?						
d. Will the proposed action result in increased used of any energy source?		X				
e. Define projected revenue sources		X				
f. Define projected maintenance costs		X				

10a: *Costs associated with construction for the fish barrier are displayed in the project budget summary. Barrier construction is currently being completed under a separate environmental review process. Costs associated with the fish barrier are displayed in the Budget Table for informational purposes only. 100% of barrier costs have been obtained through competitive grants with numerous funding partners (see table).*

20% of total project costs, primarily fish removals and re-stocking efforts would be borne by MFWP. Twenty percent of project costs would be assumed by EPA as part of the current Superfund project, and finally, less than 3% of the projects costs would be borne by the USFS. Removal of non-native fishes would pose some additional costs but would be within the current expected and required duties of MFWP personnel (Table 1; see Part I, Section B, Agency Authority). This project would be part of MFWPs ongoing WCT restoration program.

Project Budget Summary

Category	RDGP *	Missouri River Fly Fishers (TU)	EPA	PPL Mont. *	MFWP	Forest Service	* Future Fisheries	Total
Administrative Costs								
Personnel Cost			\$30,000		\$4,000	\$5,400		\$39,400
Supplies & Materials								
Communications								
Travel					\$3,000			\$3,000
Rent & Utilities								
Equipment (Travel)								
Miscellaneous (Grant Administration CCD)	\$3,300							\$3,300
Total Administrative Costs	\$3,300		\$30,000		\$7,000	\$5,400		\$45,700

Activity Costs

Personnel Cost (Barrier Construction Oversight)					\$3,000	\$300		
Personnel Cost (Non-Native Fish Removal and Rest.)					\$35,400	\$1,500		
Contracted Services (Barrier Construction)	\$110,000	\$2,000					\$10,000	\$112,000
Activity: Design and Engineering - Contracted Service			\$16,000	\$6,400				\$22,400
Total Activity Costs	\$110,000	\$2,000	\$16,000	\$6,400	\$38,400	\$1,800	\$10,000	\$184,600

TOTAL PROJECT COSTS

TOTAL COST	\$113,300	\$2,000	\$46,000	\$6,400	\$45,400	\$7,200	\$10,000	\$230,300
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* Budget columns marked with an asterisk represent funds gleaned from competitive grant programs.

RDGP – Resource Development Grant Program (approved), PPL Montana (approved), Future Fisheries (approved), TU – Missouri River Fly Fishers (approval pending)

11. AESTHETICS/RECREATION	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
Will the proposed action result in:						
a. Alteration of any scenic vista or creation of an aesthetically offensive site or effect that is open to public view?		X				
b. Alteration of the aesthetic character of a community or neighborhood?		X				
c. Alteration of the quality or quantity of recreational/tourism opportunities and settings? (Attach Tourism Report)			X		Yes	See 11c
d. Will any designated or proposed wild or scenic rivers, trails or wilderness areas be impacted? (Also see 11a, 11c)		X				

Comment 11c: There would be a temporary loss of angling opportunity in Dry Fork Creek between the time of fish removal and for several years after fish removal. This loss will be mitigated through the stocking of sterile (triploid) WCT obtained from the Washoe Park Fish Hatchery (MFWP, Anaconda, MT). Dry Fork Creek upstream of the fish barrier should be fully colonized with native/local WCT 5 to 7 years after fish removals. In most cases cutthroat trout fisheries in streams in Montana are catch and release only. If WCT numbers reach harvestable levels, limited angler harvest would be considered in Dry Fork Creek upstream of the fish barrier. Additionally, MFWP will consider a modification in regulations wherein stocked sterile WCT could be harvested by the public. These stocked fish would be identifiable by a specific fin clip, likely the adipose fin located on the dorsal side of the fish bear the caudal – or tail fin.

Cumulative Impacts: Impacts to recreation and aesthetics from the proposed action would be short term and minor. We do not expect the proposed action to result in other actions that would impact recreation/aesthetics in the Dry Fork Creek stream corridor. As such, cumulative impacts to recreation from the proposed Dry Fork Creek project should be minimal.

12. CULTURAL/HISTORICAL RESOURCES	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
Will the proposed action result in:						
a. Destruction or alteration of any site, structure or object of prehistoric, historic, or paleontological importance?		X				
b. Physical change that would affect unique cultural values?		X				
c. Effects on existing religious or sacred uses of a site or area?		X				12c
d. Will the project affect historic or		X				

cultural resources?						
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Comment 12c: The project site is located within the aboriginal range of Native American tribes. Cultural officers for tribes which would have interest in this project would be consulted prior to any decision making process. Treatment using piscicides would have little or no impact to any potential cultural sites within the project area. A cultural and archaeological survey in the immediate area of barrier construction was completed to meet USFS and CERCLA requirements.

13. SUMMARY EVALUATION OF SIGNIFICANCE	IMPACT Unknown	None	Minor	Potentially Significant	Can Impact Be Mitigated	Comment Index
Will the proposed action, considered as a whole:						
a. Have impacts that are individually limited, but cumulatively considerable?		X				
b. Involve potential risks or adverse effects which are uncertain but extremely hazardous if they were to occur?		X				
c. Potentially conflict with the substantive requirements of any local, state, or federal law, regulation, standard or formal plan?		X				
d. Establish a precedent or likelihood that future actions with significant environmental impacts will be proposed?		X				13d
e. Generate substantial debate or controversy about the nature of the impacts that would be created?	X				Yes	13e
f. Is the project expected to have organized opposition or generate substantial public controversy? (Also see 13e)	X					13f
g. List any federal or state permits required.						13g

Comment 13d: This project does not establish a precedent or likelihood that additional projects with significant environmental impacts would be proposed. A potential fish barrier construction project in Carpenter Creek may be proposed over the next several years. Carpenter Creek is currently fishless because of historical mine related activities. Proposed future mine remediation and cleanup would potentiate upstream movement of non-native fishes upstream into an existing non-hybridized population of WCT. The potential project in Carpenter Creek – namely barrier construction - would not require the application of rotenone. The success or failure of any other WCT restoration projects would have no impact on the success or failure of the proposed action.

Comments 13e and f: The use of piscicides can generate controversy from some people. Public outreach and information programs can educate the public on the use of piscicides. It is not known if this project would have organized opposition. A scoping letter describing the proposed action was mailed to landowners adjacent to Dry Fork Creek prior to drafting this EA. As of 3/12/2013 no comments have been received. Any and all efforts necessary to explain the project will be pursued during the scoping and DRAFT EA review process.

Comment 13g: MFWP would apply rotenone under the Montana Dept. of Environmental Quality (DEQ) General Permit for Pesticide Application (#MTG87000). A Notice of Intent was accepted by the Department of Environmental Quality. The NOI included the waters proposed in this EA. A letter was received from DEQ dated August 13, 2012 recognizing the Notice of Intent and allowing MFWP to operate under the General Permit for Pesticide Application.

PART IV. PARTIES CONTRIBUTING INFORMATION

- Cascade Conservation District, MT
- Montana Department of Environmental Quality, MT
- Montana Fish, Wildlife & Parks:
 - Fisheries Bureau, Great Falls MT
 - Legal Bureau, Helena MT
- U.S. Environmental Protection Agency, MT
- U.S. Forest Service, MT

PART V. OVERLAPPING AGENCY JURISDICTION

Name of Agency and Responsibility:

- Montana Department of Environmental Quality – NDPES Discharge Permit for application of CFT Legumine.
- US Forest Service, Lewis and Clark National Forest, Belt Creek Ranger District for impacts related to fish barrier construction.
- Environmental Protection Agency for oversight of Superfund and CERCLA related issues in the drainage.
- Montana Fish, Wildlife & Parks – responsible for managing fisheries resources in streams and lakes of Montana.

PART VI. ENVIRONMENTAL IMPACT STATEMENT REQUIRED?

After considering the potential impacts of the proposed action and possible mitigation measures, MFWP has determined that an Environmental Impact Statement is not warranted. The impacts of WCT restoration as described in this document are minor and/or temporary and mitigation for many of the impacts is reasonable and possible. The primary negative impacts as a result of this project are temporary reductions in aquatic invertebrate abundance as a result of toxic effects of rotenone. Impacts to aquatic invertebrates have been shown to be short term (1-2 years) and minor and invertebrate communities are very resilient to disturbances such as treatment with rotenone. Impacts to recreational fishing can be mitigated through temporary stocking of sterile WCT and changes of fishing regulations to allow harvest of WCT. Further, the benefit to native WCT, a species in need of conservation, would balance the potential negative impacts to other species both native and non-native.

PART VII. PREPARATION AND PUBLIC INVOLVEMENT

A. Prepared by: David Moser

Date: March 21, 2014

B. Public Involvement:

Submit written comments to:

Montana Fish, Wildlife & Parks
c/o Dry Fork Belt Creek EA Comments
4600 Giant Springs Rd.
Great Falls, MT 59405

Submit comments via e-mail to:

dmoser@mt.gov

A public meeting will be held at:

Monarch - Neihart Senior Citizens Center on April
23rd at 6:30 PM

Comment period is 30 days. Comments must be received by May 1, 2014

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